STATE BOARD OF REFRIGERATION EXAMINERS

Refrigeration Up-Date

VOLUME XII, ISSUE 1

MARCH, 2001

INSIDE THIS ISSUE:

Refrigeration Control Valve Maintenance

Refrigeration control valves for industrial refrigeration systems have been an important system component since the 1920s.

When a control valve fails, the result can be as significant as a more costly system component failure, such as compressor or condenser. Yet when system maintenance is the topic of discussion, few operators consider the condition of the control valve.

This article describes areas to review when a control valve has failed, procedures to follow to safely install and repair control valves, and system conditions that may affect valve performance.

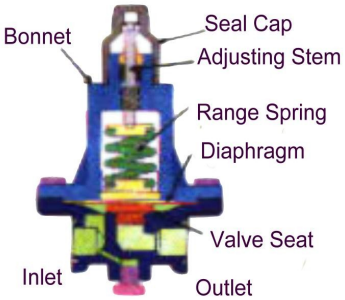
Most industrial refrigeration control valves and solenoid valves operate on the same basic principles. Thus, the information presented can generally apply to most manufacturers' control valves in our industry. However , it is advisable — and for safety reasons, necessary — to read the information provided with any manufacturers' equipment. If questions arise, contact the manufacturer for additional information.

GETTING THE SYSTEM READY FOR VALVE SERVICE

Normally, most control valves must be "pumped out" or evacuated of any refrigerant before the valve can be serviced.

When servicing a control valve, be sure the remainder of the system upstream or downstream of the valve is not adversely affected when the control valve is evacuated. This can require anything from a total system shutdown to simply opening a bypass line.

As an example, repairing a valve in the discharge line to a condenser may require shutdown of part or all of a plant's refrigeration. Whenever isolating a control valve for service, always manually open the valve to make sure refrigerant at the valve inlet and outlet is evacuated before servicing.



A typical refrigeration control valve

Solenoid-operated valves should be manually opened and energized for a short time to be sure the pilot section of the valve is evacuated.

(Continued on page 4)

SPECIAL POINTS OF INTEREST:

- *Caution must be taken whenever removing a seal cap from either a control valve or hand valve as refrigerant may be trapped in the seal cap and escape during its removal.*
- *Selecting control valves based on actual operating conditions is important. Changes in system loads will dictate whether one control valve or two control valves in parallel will be required to handle the system load.*

Disciplinary Action Taken By The Board

Penalties for violating the licensing law and Board rules vary depending on the facts and circumstances of each case.

Joe Barsuli, dba Commercial Equipment Service, Raleigh, NC. Allegations of refrigeration contracting without a license. Letter of Warning signed March 30, 2001.

Kim Birmingham, dba Birmingham's Service and Repair, Pittsboro, NC. Allegations of refrigeration contracting without a license. Letter of Warning signed February 12, 2001.

Robert Taylor, dba Southeast Mechanical Contractors, Smyrna, NC. License 3693. Allegations of incompetence in the business of refrigeration contracting concerning Respondent's installation of a walk-in cooler. At hearing, it was found that the installation was deficient as follows: (a) evaporator coil not at-

(Continued on page 6)

STATE BOARD OF REFRIGERATION EXAMINERS

Volume XII, No. 1

Published quarterly as a service to refrigeration contractor licensees and others in the refrigeration industry.

Suggestions for articles of interest for publication in this newsletter are welcome.

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CFC TESTING SCHEDULE

HOW TO REGISTER FOR THE CFC CERTIFICATION EXAM

There are several ways to register for the CFC exam. Type I exams are available through the mail. To order a Type I mail-in application, you may either call our office and request an application or you may download and print out an application from the website(www. refrigerationboard.org). The State Board of Refrigeration Examiners offers testing through the community colleges. Known testing dates for some of the community colleges are listed below. To find out if a college convenient to you is testing, please call that college.

HOW TO CONTACT THESE TESTING CENTERS

Asheville Buncombe Tech, M.J. Ferrell, 704-254-1921. Classes are held Tuesday and Thursday nights from 6:00 - 9:00 pm, five sessions-two include the basic refrigeration cycle, two review the exam information, and the fifth session is for testing.

Central Piedmont Community College, Kathie Cox, 704-330-6508.

Davidson Co. Community College, Randall Parks, 336-249-8186, ext. 244. Classes will be held on Monday evening from 6-10 pm.

Wilson Technical Community College, Karen Gliarmis, 252-246-1232 or kgliarmis@email.wilsontech.cc.nc.us The above classes will meet Monday 6:30 pm to 9:30 pm and are four sessions at the Wilson Tech Small Business Center.

CFC CLASS SCHEDULE

CFC classes and exams have been scheduled as follows: Additional classes will be published as they are received in this office. Please contact the individual community college if you or your employees are interested in one of these classes. Most colleges run these courses with a minimum enrollment so classes may be canceled if enrollment is not met.
Davidson Community College runs the CFC classes at their Mocksville and Davie campuses on a TBA (to be arranged) basis. Individuals may call the continuing education office at 336-249-8186, ext. 710 or contact Randall Parks at ext. 244 to have their names put on an interest list.

April, 2001
April 2-23 — Wilson CC
April 21 — Central Piedmont CC
April 23 & 30 — Davidson CC
April 30-May 21 — Wilson CC

May, 2001
May 8 — AB Tech
May 19—Central Piedmont

June, 2001
June 16—Central Piedmont

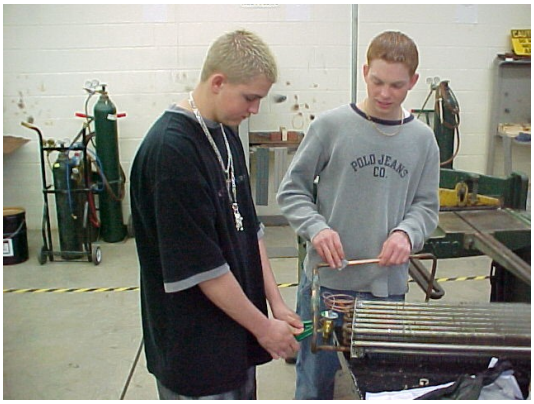
July, 2001
July 21—Central Piedmont

September, 2001
September 15—Central Piedmont

October, 2001
October 20—Central Piedmont

December, 2001
December 1—Central Piedmont

NC-Skills USA-VICA HVAC & R COMPETITION



Shown to the left are Nick Keziah and Steven Clayton, students in Gary Ramsey's HVAC & R program at N.F. Woods Advanced Technology Center in Mooresville, NC. Nick placed first and Steven placed second at the recent NC-Skills USA-VICA HVAC & R competition. Nick will go to Kansas City, MO in June to compete in the National competition.

LAPSED LICENSES

As of March 27, the licensees listed below have not renewed/reinstated their license for calendar year 2001. G.S. 87-64 reads, "The license of every person licensed under the provisions of this statute shall be annually renewed … Failure to renew annually shall automatically result in a forfeiture of the right to engage in the refrigeration business. Any licensee who allows his license to lapse may be reinstated by the Board upon payment of a fee not to exceed seventy-five dollars ($75.00); provided any person who fails to renew his license for two consecutive years shall be required to take and pass the examination prescribed by the Board for new applicants before being licensed to engage further in the refrigeration business". An up-dated register of licensees may be found at the Board's website (www.refrigerationboard.org). This register is up-dated on a monthly basis.

692 Alford, Billy L., Wilmington, NC
3487 Allen, Kenneth L., Graham, NC
3520 Allen, Robert T., Charlotte, NC
2328 Alligood, Harold, Chocowinity, NC
749 Atkinson, Thomas E., Tarboro, NC
1848 Badger, Craig N., Gastonia, NC
3033 Ballentine, Jr., Arthur B., Moyock, NC
2947 Behling, Richard A., Mt. Holly, NC
2949 Benson, Kevin W., Jacksonville, NC
1789 Bischer, James R., Randleman, NC
3881 Bishop, Robert, Trinity, NC
1242 Bomberger, Paul T., Burlington, NC
1292 Boyd, William R., Greenville, NC
3762 Brown, Milton J., Ocean Isle, NC
T0012 Bulkley, James, Statesville, NC
3176 Burleson, Johnny H., Mt. Gilead, NC
3350 Butner, Jr., James C., Advance, NC
T0066 Chambers, Greg, Hertford, NC
3306 Chapman, Bobbie K., Lincolnton, NC
T0063 Chavis, Johnny R., Ahoskie, NC
2025 Childers, Paulette R., Kings Mountain,NC
1821 Clark, Roger B., Lincolnton, NC
2209 Clayton, Chandler F., Hurdle Mill, NC
3073 Compton, Kenneth D., Mebane, NC
2372 Craddock, Louis P., Edenton, NC
2160 Crainshaw, Mitchell W.,Kannapolis, NC
3222 Craven, Mark, Chapel Hill, NC
2374 Crawley, James W., Morganton, NC
2958 Culver, Sean H., Fayetteville, NC
1753 Curtis, Verlin L., Franklin, NC
332 Daddario, Frank T., Durham, NC
2379 Davis, Don F., Kannapolis, NC
1525 Dawson, Jr., James H., Ernul, NC
2067 Delk, Mariam A., Archdale, NC
84 Delk, Mitchell, Archdale, NC
1244 Dodson, Michael L., Graham, NC
3767 Dorman, Robert E., Camden, NC
274 Downing, R. Alton, Wilmington, NC
1856 Dowty, Roy G., Beaufort, NC
T0039 Doyle, Donald R., Wilmington, NC
2127 Dunnells, Arnold M., Richlands, NC
2384 Eanes, Willis, Roxboro, NC
1640 Ellis, Jack A., Raeford, NC
3184 Fancher, Dennis A., Ocean Isle Beach, NC
3389 Farrar, David S., Raleigh, NC
841 Frederick, Dawsey L., Warsaw, NC
2708 Frisbee, Paul D., Fuquay-Varina, NC
289 Gardner, Luther J., Benson, NC
3554 Garrison, Gary L., Burlington, NC
2013 George II, James H., Durham, NC
2233 Goins, Arthur R., Greensboro, NC
3556 Goldsborough, Brice F., Waterbury, VT
3557 Harris, Daniel, Stanley, NC
3723 Heath, Paul D., Greenville, NC
3598 Herrin, Joseph K., Gainesville, GA
171 Hewitt, W. W., Charlotte, NC
629 Hill, Wade F., Albemarle, NC
3159 Hilton, Charles V., Thomasville, NC
2130 Hinson, Bobby L., Edgewater, FL
1164 Holsclaw II, Guy L., Raleigh, NC
2679 Honbarrier, Jerry L., Kannapolis, NC
611 Hunter, Herbert N., Charlotte, NC
1475 Jackson, Ronald R., Gold Hill, NC
3599 James, Tony C., Hubert, NC
462 Johnson, Baxter D., Spruce Pine, NC
789 Johnson, Linwood G., Benson, NC
2716 Johnson, Robert L., Charlotte, NC
2981 Jones, Donald B., Wilson, NC
1391 Jones, James A., Florence, SC
3357 Jones, Jimmy R., Fallston, NC
2109 Jones, Mack, Elizabeth City, NC
3500 Jones, Jr., David J., Lewes, DE
426 Jordan, C. L, Wilmington, NC
1706 Joseph, Allan E., Midway Park, NC
3089 Julitz, Donald, Orange Park, FL
2990 Key, Wm. Sherman, Myrtle Beach, SC
3799 Key, Jr., Melvin S., Winston-Salem, NC
2911 Kimmer, Jr., Clarence W.,Hubert, NC
601 Kimmer, Sr., Tross T., Statesville, NC
3502 King, Jr., Clayton E., High Point, NC
2718 King, Sr, Chester W., Albertson, NC
1393 Kinton, Robert M., Fuquay-Varina, NC
965 Knowles, C. J., Greenville, NC
2259 Knox, Gordon, Aulander, NC
1985 Kroustalis, Jack, Winston-Salem, NC
106 Laughinghouse, Robert, New Bern, NC
966 Le Ray, Alton H., Wilmington, NC
1927 Lea, Charlie M., Roxboro, NC
3775 Leftwich, Mark D., Mt. Airy, NC
3327 Lewis, Harry G., Sneads Ferry, NC
3465 Lindner, James A., Hendersonville, NC
1929 Long, Robert E., Concord, NC
548 Lutz, Hansel L., Terrell, NC
2270 Mabe, Jack W., Oak Island, NC
1168 Mabry, David J., Alpharetta, GA
2647 MacDonald, Robert E., Dudley, NC
2452 Mayberry, L. G., Barium Springs, NC
1143 McBee, Sr., Larry W., Gastonia, NC
191 McCoy, Ben W., Charlotte, NC
374 McKeithan, Jasper B., Fayetteville, NC
1357 McQueen, Samuel E., Goldsboro, NC
3863 McStay, Aubrey J., Kennesaw, GA
3162 Mercadante, Robert N., Glen Cove,NY
3622 Messick, Randy, Wendell, NC
1610 Miller, Gene S., Goldsboro, NC
3858 Milligan, Darrell T., Callahan, FL
3163 Moore, Warren T., Calabash, NC
3198 Moran, William C., Burlington, NC
3824 Morton, Jr., Terry W., Kannapolis, NC
2731 Moser, Dwayne T., Efland, NC
3432 Mullins, Wesley E., Wilson, NC
2465 Myers, Herman L., Parkton, NC
3531 Neil, John A., Gainesville, FL
3468 Nichols, Jeffrey L., Willoughby, OH
2279 O'Briant, LeRoy R., Durham, NC
3653 Omar, Shaw A., Raleigh, NC
2818 Pahel, Thomas Dixon, Fayetteville, NC
2919 Parker, Jerry W., Rocky Mount, NC
1232 Paul, Normand E., Surf City, NC
2281 Peedin, Ronald V., Jacksonville, NC
3510 Picklesimer, James K., Highlands, NC
3435 Place, Richard M., High Point, NC
1176 Poe, Leon G., Winston-Salem, NC
2481 Pope, Billy R., Aberdeen, NC
1669 Potter, Cecil D., Marion, NC
2111 Poythress, Steven G., Henderson, NC
1334 Rankin, John R., Harrisburg, NC
2860 Rathgeb, Robert, Fayetteville, NC
3058 Rhew, Paul W., High Point, NC
1834 Rice, Ralph E., Asheville, NC
3008 Rider, Chris P., Boone, NC
992 Rose, Peter A., North Myrtle Beach, SC
3965 Ross, Reagan D., Raleigh, NC
3010 Seefeldt, Edwin P., Cleveland, NC
1450 Sharpe, Paul B., Fayetteville, NC
1950 Simmons, Sr., James M., Durham, NC
2603 Skipper, Morris G., Elizabethtown, NC
1838 Small, Terry L., Burlington, NC
1876 Smith, Hubert C., Beaufort, NC
2027 Smith, Kenneth F., Oak Harbor, WA
12 Smith, W Ansel, Asheville, NC
2145 Sparks, Ricky D., Mocksville, NC
3014 Sparks, Tommy W., Mocksville, NC
3745 Stanger, Greg, Kansas City, MO
1840 Strickland, Wayne N., **Wilsons Mills,** NC
3793 Strickland, III, William, Wendell, NC
3280 Strickland, Jr., C. W., Nags Head, NC
2522 Syfrett, Joe K., Spring Lake, NC
2788 Tannery, Jerry, Garner, NC
2693 Thackston III, Turner B., Charlotte, NC
1680 Torrence, Thomas L., Concord, NC
3246 Townsend, Branson E., Dudley, NC
597 Tucker, J. E., Lake City, SC
T0011 Tumblin, George E., Charlotte, NC
1681 Tuttle, Joseph L., Rural Hall, NC
3796 Van Pelt, Dale R., Cherryville, NC
285 Vernon, Jr., J. R, Winston-Salem, NC
819 Wagner, William M., Lexington, NC
286 Wagstaff, Marvin L., Kernersville, NC
1959 Walker, Louis S., Plymouth, NC
2536 Walters, Elzie J., Lumberton, NC
973 Waters, Glen B., Newton, NC
T0064 White, Donald F., Windsor, NC
2543 Whitesell, Frank W., Wilmington, NC
2001 Wilkerson, Jimmie, Ocean Isle Beach, NC
3377 Willard, Bradford L., Greensboro, NC
3345 Wilson, William J., Ruther Glen, VA
2612 Womack, James G., Flet Rock, NC
2325 Workman, Ronald A., Trinity, NC

EPA ADDS SP34E TO SNAP PROGRAM

The Environmental Protection Agency has added another HFC-based refrigerant to its list of alternatives to R-12. The EPA, under its Significant New Alternatives Policy (SNAP) program, added SP34E to the list.

The announcement came from Solpower Corp, a U.S. distributor of the refrigerant.

The approval enables SP34E to be used as an acceptable substitute for R-12 in virtually all applications except centrifugal chillers, according to the EPA.

In EPA documents, the refrigerant is said to be "acceptable for use as a substitute for CFC-12 in the following end uses: household refrigerators and freezers, refrigerated transport, retail food refrigeration, cold storage warehouses, vending machines, water coolers and reciprocating chillers."

Further the federal agency noted that, "Flammability testing by an independent laboratory has determined that SP34E as blended is not flammable. SP34E has no flash point".

According to Solpower, the refrigerant is a "near drop-in replacement for R-12 in mineral oil-based refrigerant applications". "It is a single-component refrigerant with trace addi-

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Valve Maintenance cont.

(Continued from page 1)

Always tag any isolation valves against accidental closure or opening. Always tag and lock any electrical control circuits to prevent power from accidentally being turned back on. Always be sure liquid lines are evacuated before isolating sections so liquid expansion will not occur. This caution also applies to refrigerant vapor lines or oil lines.

Beware of strainers and sections of piping that may trap liquid refrigerant or residual oil and may require a longer time to evacuate. Caution must be taken whenever removing a seal cap from either a control valve or hand valve as refrigerant may be trapped in the seal cap and escape during its removal.

Always follow accepted safety practices when servicing any part of a refrigeration system. These include — but are not limited to — using safety glasses or a face shield, and having protective equipment and personnel trained in its use readily available. Also, identify locations for cold-water eye-wash stations, exits, and fire extinguishers.

INSTALLATION NOTES

During installation or servicing, keep valves clean and free from dirt and moisture. When provided, be sure to leave plastic protectors in place until installation.

Always allow proper clearance for installing valves. Do not use the valve to "stretch" or "align" pipe. Using flange bolts to close a large gap can distort or stress the valve. This can cause the valve to malfunction or the flange bolts to fail.

Always be sure the valves and piping are properly supported to avoid stressing the valve or piping. Be sure to follow the valve manufacturer's bolt torque specifications for tightening bolts and nuts.

Avoid installing valves where they may be damaged by material handling or other equipment. Be sure to provide for clearances necessary to service control valves and strainers. This information is normally provided in the manufacturer's service bulletin.

Check to be sure the valve is installed in the proper direction of flow. Most solenoids and pressure regulators will allow reverse flow if a higher pressure downstream (than upstream) develops. Check valves at the outlet of these valves are required to prevent reverse flow through a regulator or solenoid.

Caution: Never install a check valve at the inlet of a solenoid or pressure regulator with electric shut-off. The consequences of trapping liquid between the two valves may be dangerous and destructive.

Once we are certain that the valve is evacuated of refrigeration and reduced in pressure, the valve is ready to be opened to atmosphere.

VALVE TEARDOWN

A simple set of procedures should be followed to tear down a control valve.

When a control valve is insulated, remove the insulation carefully by cutting it in pieces that can be reused and repaired. If the control valve is a solenoid or is solenoid operated, be sure the coil is de-energized and cannot energize while off the solenoid bonnet tube.

If the valve is a pressure regulator, back off the adjusting stem so there is no longer tension on the bonnet spring. This is not required on valves that have sealed pressure pilot assemblies, since the pilot assemblies cannot be disassembled or repaired and must be replaced.

If the valve is to be repaired and returned to service, be sure to have a new set of flange bolts on hand and a gasket kit. Flange bolts may have to be cut off to remove the valve from the line.

Having a gasket kit on hand will allow you to determine the problem with the valve and reinstall it as may be necessary until the proper repair parts are available. Many system have a backup or "swing" compressor in case the compressor fails. It would make sense to determine those valves that are extremely critical to system operation in order to have replacements on hand should failure occur.

Many control valves available today can be converted into a number of variations. Having a few components on hand may allow one valve to back up several similar devices in different parts of a system.

Take the time to investigate the versatility of the valves installed. This could avoid a costly problem, not to mention saving time should a failure occur.

Always have the valve service bulletin on hand as a reference if questions should arise during teardown or assembly. Control valve service bulletins usually have a troubleshooting guide to help you determine the cause of a problem or failure.

COMMON PROBLEMS

Some of the more common problems encountered include:

- *Control of the system pressure cannot be maintained.*

Symptoms: Pressure fluctuates or "swings", the control valve chatters.

Cause(s): The valve is oversized, the actual load has decreased to a condition less than the valve's minimum capacity, or the control valve was selected at a pressure drop lower than actual operating conditions.

- *System pressure cannot go below a certain pressure.*

Symptoms: Pressure difference across the control valve does not change even when it is manually wide open. Pressure setting on regulators can only be made above a certain set point.

Cause(s): The valve is undersized, the actual load is much greater than what the control valve was selected for.

- *Valve fails to either open, close, or regulate.*

Cause(s): The pilot seat or main valve seat has dirt on it, is eroded, or has an obstruction on it that prevents the seat from closing. The pilot passages are obstructed. The diaphragm is cracked and the valve is in the wrong control pressure range for the application. The piston is jammed due to dirt. The piston and/or piston bore may be worn to a point where the diametrical clearance is too large.

The latter condition could also cause an excessive pressure drop across the valve during operation. In some instances, the pressure drop across the control valve may not be high enough to pen or keep the valve open. Solenoid valves may also have a coil shorted or fuse may be blown.

Damaged or worn parts can also assist in determining system problems and causes of valve failure. Worn pistons, valve port plugs, and stems that appear

(Continued on page 5)

Permanently Lapsed Refrigeration Contractor Licenses

The following refrigeration contractor licenses permanently lapsed 12/31/2000 for non-payment of licensing fees:

2153	Andrews, Richard M.,Lumberton, NC
2191	Barefoot, Earl, Goldsboro, NC
2342	Biggs, Sr., Billy C., Durham, NC
979	Brame, Paul L., Greensboro, NC
2123	Brown, James L., Fayetteville, NC
1426	Burris, Ricky J.,Norwood, NC
2203	Byrd, James W., Lexington, NC
1732	Crumpton, James G., Burlington, NC
1855	Davis, Jr., T. Carson, Southern Pines, NC
1432	Deese, Beauford C., Clayton, NC
3288	DeHart, Harold F., Durham, NC
3552	Dunn, Randal C., High Point, NC
2895	Eller, William J., Haw River, NC
2896	Flowe, Sr., Ted W., Matthews, NC
401	Floyd, Lester W., Lumberton, NC
2228	Furstenberg, Harold F., Williamston, NC
1588	Geier, Peter J., Spring Lake, NC
209	Godwin, W. L., Gastonia, NC
3293	Green, Douglas C., Garner, NC
2968	Griffin, David H., Laurinburg, NC
3268	Griffin, William H., Matthews, NC
2407	Grimm, John D., Carthage, NC
2240	Hart, J. Harry, Lawndale, NC
2245	Hicks, Thomas H., Dunn, NC
1282	Hobgood, George F., Black Creek, NC
1705	Holloman, William V., Nashville, NC
2427	Houk, Robert C., Lincolnton, NC
3423	Jakubowski, Janusz, Chapel Hill, NC
1708	Larabee, Marion G., New Bern , NC
1659	Lauramore, Kenneth M., Jacksonville, FL
1328	Lawrence, Dannie B., Beaufort, NC
2077	McDow, George E., New Bern, NC
836	McGee, Wilmer, Brevard, NC
3052	Montgomery, Donald H., Lady Lake, FL
2683	Moore, Cecil R., Rockingham, NC
729	Moore, W. R. Concord, NC
3433	Necessary, Stephen E., Winston-Salem, NC
3779	Nelson, John A., Clayton, NC
3508	Oty, John D., Stanley, NC
2280	Palmer, Clyde T., Roxboro, NC
643	Penny, Aaron E., Greenville, NC
3701	Perry, John L., Greenville, NC
1543	Perry, Larry N., Mooresville, NC
3851	Rountree, Jr., Marvin, Rocky Mount, NC
3102	Salomon, Kurt C., Grahamsville, NY
2052	Smith, David L., Raleigh, NC
3612	Strasser, Sharon A., Moultrie, GA
2118	Talton, Jackie, Lumberton, NC
3303	Thompson, Ernest D., Hohenwald, TN
3794	Tribou, Harry R., Wilmington,NC
1269	Welch, Joe B., Cary, NC
2541	Whitaker, Frank, Aulander, NC
974	Whitaker, Roy K., Kernersville, NC
2547	Wilson, Arthur L., Lumberton, NC

NOTICE ... THE BOARD WILL NOT PUBLISH A REGISTER THIS YEAR. THE REGISTER MAY BE FOUND AT THE BOARD'S WEBSITE AND WILL BE UP-DATED MONTHLY. THE ADDRESS OF THE WEBSITE IS WWW.REFRIGERATIONBOARD.ORG

Valve Maintenance cont.

(Continued from page 4)

to have a dull, sand-blasted surface are generally indicative of parts exposed to flashing liquid. This condition can also cause pistons to wear below accepted diametrical tolerances. When this occurs, excessive pilot gas can blow past the piston, requiring a higher-pressure drop to open.

This wear will occur when the proper conditions exist to cause liquid to flash or expand. This condition can cause premature wear or failure of valve internal parts. Generally, subcooling the liquid and/or reducing the pressure difference through the valve can help to reduce this problem.

Cracked diaphragms are usually indictors of over-pressurizing a valve. Or, this can be a sign of an undersized valve causing the diaphragm to work very close to the pilot seat. This can set up a high-frequency vibration or resonance that will stress the diaphragm material and cause it to fail.

The solution to this problem is to create conditions that allow the valve seat to operate in a more open position. This can be accomplished by either lowering the pressure drop across the valve or reducing the valve capacity by installing reduced capacity main valve assemblies.

When piston stems or opening stems appear to be "mushroomed," this is usually an indication of the valve chattering or rapidly opening and closing, causing the internal parts to impact against each other. Typically, this is caused by oversized valves.

An unusual occurrence sometimes encountered is valve plugs or v-ports that have wear marks indicating a spinning action. This occurs in high-velocity gas lines, such as discharge lines or hot gas lines. The corrective action to eliminate this phenomenon is to reduce the gas velocity or install a valve with an anti-spin construction.

You may also encounter solenoid coils that fail, usually tripping the circuit breaker or blowing a fuse. This normally occurs due to the coil winding wire insulation breaking down internally and causing a short in the windings.

Other coil failures may be due to improper coil voltage (less than 85% or more than 110% of rated coil voltage), allowing the coil to be energized when not in place on the valve bonnet tube, or the plunger assembly not picking up when the valve is energized, causing the coil to overheat.

CONTROL ARRANGEMENTS, CONTROL VALVE SELECTION

Selecting control valves based on actual operating conditions is important. Changes in system loads will dictate whether one or two control valves in parallel will be required to handle the system load.

Improperly sized valves can wear prematurely and fail at the most critical times. Dirt or contamination in the refrigeration system will affect reliable valve operation as well as other important system components. Whenever a system is serviced or a new system is installed, care should be taken to keep piping, vessels, evaporators, and other components as clean and contaminant-free as practical.

Another area of concern is pressure or temperature shock. This occurs when a sudden change in system pressure or temperature takes place and creates a severe strain on all system components. An example of such an condition occurs after termination of hot gas injection for low-temperature hot gas defrost evaporators.

In the past, systems were designed to open the suction stop valve after defrost and proceed directly into the refrigeration mode. When this occurred, there was generally about 70-psig pressure still in the evaporator which was then released directly into a 0-psig or less suction line, via a large-port automatic valve.

Many systems now incorporate a small bleed-down solenoid valve in parallel with the suction stop valve, which is controlled by a bleed-down period in the defrost cycle to open before opening the suction valve. This allows the evaporator to slowly equalize to suction pressure, thereby eliminating the sudden surge of pressure that occurs when a larger suction valve opens. Always consult the valve service bulletin or the factory before applying a valve in a unique manner or application.

As a final note, always be sure the control valve selected for an application

(Continued on page 6)

STATE BOARD OF REFRIGERATION EXAMINERS

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Raleigh, NC 27605

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Fax: 919-755-5024
Email: sbre@mindspring.com
Website: www.refrigerationboard.org

BULK RATE
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PAID
RALEIGH, NC
PERMIT NO. 2287

WE'RE ON THE WEB:
WWW.REFRIGERATIONBOARD.ORG

Disciplinary Action cont.

(Continued from page 1)

tached to ceiling, (b) drain piped wrong, (c) wire from disconnect was drop cord, (d) lines not insulated properly, and (d) pressure control not properly set causing compressor failure. Respondent's installation was contrary to the mechanical and electrical codes. Respondent failed to appear at the hearing. Respondent Taylor previously entered into a Consent Order with the Board in 1997 that included a determination that he had failed to provide competent refrigeration contracting services. Respondent Taylor's refrigeration contracting license is revoked.

Mark T. Trickey, dba Climate Control, Inc., South Boston, VA. Allegations of refrigeration contracting without a license. Letter of Warning signed February 5, 2001.

SP34E ADDED

(Continued from page 3)

tives." The company said it is 98.5% R-134a, but the additives mean a change-out from mineral oil is not needed in retrofits.

For more information, contact Solpower at 4742 W. Adams St. #2, Phoenix, AZ 85009.

Valve Maintenance cont.

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is capable of performing the control function required of it. When questions arise, check the service bulletin, check with the factory, and recheck the application.

The initial time spent on this evaluation process may be insignificant compared to reviewing and correcting a misapplication of a control valve, once installed.

Warning: Failure, improper selection, or improper use of the products and/or systems described in this article can cause death, personal injury, and property damage. Due to the variety of operating conditions and applications for these products and systems, the user, through analysis and testing, is solely responsible for making the final selection of the products and systems, and for ensuring that all performance, safety, and warning requirements of the applications are met.

Information in this article was developed by the engineering and sales departments of the Parker Hannifin Refrigerating Specialties Division. For more information or detailed safety instructions, contact the company at 708-681-6300; 708-681-6306 (fax); www.parker.com/refspec (website).